



## The Reverchon Naturalist

*Recognizing the work of French botanist Julien Reverchon, who began collecting throughout the North Central Texas area in 1876, and all the botanists/naturalists who have followed ...*

### Drought, Heat and Native Trees

*Story by Bruce Kreidler  
Abilene, Texas*

Anybody that has traveled in Texas this year will have noticed that not only most of the land browned out, but also if you look at the trees in the fields and beside the roads, they aren't looking so good either. It doesn't take a rocket scientist to realize that extreme high temperatures combined with, and partially caused by, drought are hard on trees.

Since I'm pretty sure that most of the people reading this article understand very well that drought is a problem for trees, the question isn't is the present drought going to have an effect on trees, but rather, what are the present effects of the drought and what is going to be the end result of this damage?

First of all, even though we, as humans, think that we invented the laws of supply and demand, the fact is, nature (as always) was way ahead of us on that one. Trees have a lot of needs, but one of the biggest ones is to be able to supply water out of the ground and to the foliage on a reasonably steady basis. Since obviously, rainfall is usually not on an even schedule, trees have come up with a lot of different ways to buffer that unsteady supply versus constant need equation.

The problem that trees are having now is that even though they have developed different methods to handle a temporary lack of available water,

ranging from simple things like more extensive root systems, to more drastic measures like premature defoliation, what they actually have little defense against is a very prolonged period of no appreciable water supply.

By the way, even though they are usually the same species, there is a difference in landscape trees and native trees, which are untended plants that have to fend for themselves. While they are indeed the same basic trees, the differences between the environments that they live in are huge and thus overall general environmental factors such as drought, temperature, and insect infestations act on them differently. For the purposes of this article, I'm referring to trees that are on their own, untended for their entire lives in fields, pastures, forests, or just wherever nature has placed them and refer to them as native trees.

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*During this year's severe drought these Redberry Juniper needles are turning brown while the Mesquite stays healthy. (Photo Credit: Jeff Groves, USDA-NRCS)*

# See You Down the Road

By Ricky Linex  
NRCS Wildlife Biologist  
Weatherford, Texas

**A**ttitude is everything. Those three words are especially true since we have just endured the warmest and driest year on record. Grasses on both rangeland and pastureland fields were dormant for the majority of the recent growing season.

Forbs, even including the normally reliable perennial species, were largely no shows this year while the annuals failed to even get out of the gate. Trees, shrubs and woody vines are also suffering with the final results largely yet to be determined. The wild birds and animals that depend upon the grasses, forbs and woody plants for food and cover have also suffered decreases in numbers this year. Also, livestock has been shipped across several state lines to find suitable forage. The weather forecasts paint dreary pictures of what is to come. It would be easy to wring our hands and cry O' woe is me, but attitude will help us to survive this dry spell.

I recently attended a riparian assessment on the upper waters of the Nueces River near Montell, and a statement during the group introductions by one of the landowners struck a chord with me. The simple but powerful words of Linda Ellinger showed the right attitude we all need to culture: "I grew up in the 1950s, I lived through one drought, and I can make it through this one," Ellinger said.

The right attitude will carry us through whatever comes in the next few years, be they wetter or dryer than normal, and Linda is showing us the way with an upbeat attitude. During the depths of the aerial bombings of Britain during World War II, Winston Churchill lifted the spirits of his people with just a few words, "Never, never, never give up." If you want to read a great book on how bad it was during a real drought, pick up a copy of *The Worst Hard Time* by Timothy Egan. This 2006 book interviewed several survivors of the dust bowl days in the early 1930s. This book tells in detail the hardships of surviving during this extended drought.

When it gets so desperate that you resort to canning young tumbleweeds, then we will know it is bad. After hearing of one family eating the canned tumbleweeds, local officials of Cimarron County, Oklahoma, declared a Russian Thistle Week where folks were encouraged to go out and harvest the young, tender tumbleweeds for food. The matriarch of the first family to can tumbleweeds, Ezra Lowery stated, "I'm not gonna put my family in a soup line. Not me, we have food here and a roof over our heads." Now, that is truly the right attitude we all can catch and live for every day.

## White Prickly Poppy (*Argemone albiflora*)

Story by Znobla Wootan

Native American Seed Company

Junction, Texas

I don't know if anyone else has noticed, but there is a wildflower valiantly blooming in this crazy Texas heat. On closer inspection the bloom looks similar to a poppy and the stem and leaves have the same bluish green tinge that other poppies have but this Texas Native is absolutely covered with prickles. It is our very own White Prickly Poppy. It is covered with so many prickles that even the deer and cows leave it alone. White Prickly Poppy (*Argemone albiflora* spp. *Texana*) can be found from Northern Arkansas and Southern Missouri to Texas. In the southern and western parts of Texas, a Rose Prickly Poppy can be found with blooms in shades of pink and lavender. Further south and down into Mexico, the Mexican Prickly Poppy can be seen with its distinctive yellow blooms.

All varieties exude a yellow sap that has been used by Native Americans for many ailments. Records of its use date as far back as the Aztecs, when their priests would use the plant in their sacrifice rituals. The Comanche's so revered the plant for its many uses that they made offerings to it during harvesting. The sap was used to remove warts, treat cold sores, and other skin ailments. A concoction from the flower can be made to treat lung congestion from colds or flu. The seeds can be used as a laxative, as an emetic to induce vomiting, and make a mild sedative. A tea brewed from the entire plant can be used to treat bladder infections, prostrate pain, or the throbbing pain of a migraine. A wash made from the tea can be used to treat sunburn or scraped skin. To produce both a euphoric and mild sedating effect, the plant was smoked in important ceremonies. However, it should be noted that as with many beneficial plants if not used properly they can be very toxic.

The seeds are the only nutritional part of the plant. The seeds also are an excellent source of food for both quail and dove. Not only do they have a high oil content making it highly beneficial, for the plant produces a large number of seeds each year that makes it a reliable and dependable food source. The production of large quantities of seeds also makes it easier to establish in your native landscape, and large colonies can form in sandy or well drained sites.

White Prickly Poppy seeds contain as much oil as soy beans. One interesting fact that I uncovered doing this research was that during WWII the oil from these seeds was used as a fine lubricant. The article didn't say for what or if it was sold to the public, so I might be doing a little bit more digging to find out. In the meantime, while enduring this searing heat, I will enjoy watching the pollinators visit my stand of White Prickly Poppy as they crawl across the three-inch blooms that contain an abundance of pollen and just a taste of nectar. (Photos Courtesy of Native American Seed Company)



Pollinators like these bees, left, love the pollen and nectar of this three-inch bloom. While the nutritious seeds from the White Prickly Poppy, right, are a great source of food for both quail and dove.



White Prickly Poppy  
(*Argemone albiflora*)



*(Continued from page 1—Drought, Heat and Native Trees)*

In a discussion about trees and water, there is a term that soil scientists often refer to as the permanent wilting point. What this phrase is supposed to mean is that at some (measurable) point, when the soil moisture content falls to a low enough level, any trees that are living in that soil will not be able to sustain themselves and will fail due to the lack of that moisture. Keep in mind the people (mostly soil scientists) that came up with and use this term, are much smarter than I am, so I pay a lot of attention to this concept at seminars and in papers/books.

What I have discovered over the years (unfortunately, in Texas I get to see lots of dry conditions) is that not only does this wilting point vary between species of trees, but it can actually vary between different individual plants of the same species. This is no mystery to anybody, for some kinds of trees handle drought much better than others. Therefore, to carry it a little further, even in the very drought tolerant species, there will be individual trees that are even tougher still.

What we are seeing in native trees right now is the effects of long-term water shortage. Some of those trees are dead already and some of them are still alive at this point, but will not be able to recover. In addition, others are struggling but will be able to make it if we get some rain, and even at this point there are a lot of trees that are still in decent health and in the presence of water, would recover quite well.

The future of our native trees, or at least the individual specimens and stands of them depends on how much longer this drought lasts. If the drought continues, what we will see is mortality as a percentage of remaining trees increasing in an upward curve as the effects of little or no water intensify. If we get rain and the drought breaks are highly diminished, we will see things return to a more normal appearance, with some of the already weakened trees continuing to fail.

What I can't tell you, is if the long-term effects of this drought are good or bad for our overall tree population. While it would be simple enough to say that losing a lot of trees is a bad thing, it might easily turn out over the years that our native tree population may actually benefit from having a lot of the weakest trees die off to be replaced with hardier specimens.

While I have a deep interest and fascination with nature, the one thing that I know I'm not capable of is predicting the final results of events in the natural world.



*With one of the worst droughts in Texas history this year, these Cedar Elms, left, are showing stress and early browning of the leaves. (Photo Credit: Ricky Linex, USDA-NRCS)*

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# Conservation Time Passages

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## “Botanizing In Texas II”

By J. Reverchon

*This article by Julien Reverchon is the second part printed from The Botanical Gazette, January 1886. We carefully added current scientific and common names for ease in reading because the original article listed only scientific names. Many of them have been renamed during the 125 years since this original article was written by Reverchon. A special thanks to Greg Huber, USDA-NRCS, in Odessa, Texas, for sending this jewel of botanical history to us. This second part of Reverchon's journey concludes both his entries in The Botanical Gazette. All plant photographs courtesy of Ricky Linex, USDA-NRCS.*

In this locality (House Mountains) two entirely new plants were discovered, and both have been decorated with the name Reverchonii, a *Diplachne* [genus was renamed *Leptochloa* and one of the sprangletops but unable to locate *reverchonii* in current literature, plant was mentioned as a synonym in *Manual of the Grasses of the United States*], and a *Campanula* (*Campanula reverchonii*, basin bellflower). The latter is a little annual, making long ribbons of the finest blue in the cracks of the rocks, with here and there a large tuft of *Cereus pectinatus* [genus renamed and likely referring to *Echinocereus reichenbachii*, Lace hedgehog cactus] all ablaze with its beautiful pink blossoms, or a picturesque cluster of *Cereus paucispinus* (formerly *Echinocereus triglochidiatus* var. *paucispinus*, now *Echinocereus coccineus*, claret cup cactus) covered with brick-red flowers. The more noted plants collected here were: on the side of the mountain, *Metastelma Palmeri* (*Cynanchum maccartii*, MacCart's swallow-wort) *Zexmenia hispida* (*Wedelia texana*, orange zexmenia or hairy wedelia), *Cyclanthera dissecta* (cutleaf cyclanthera), *Ipomoea lindheimeri* (Lindheimer's morning-glory); on the banks of a sandy creek, *Astragalus leptocaulis*, [species name is not used today but plant is either a milk-vetch or locoweed] and a variety of *Mentzelia Wrightii* (*Mentzelia albescens*, wavyleaf blazingstar) with very small flowers.



Lace hedgehog cactus  
(*Echinocereus reichenbachii*)

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From House Mountain to Mason is a region that is mostly sandy or rocky where three rare plants were collected, including *Panicum ciliatissimum*, (*Urochloa ciliatissima*, fringed signalgrass) *Brazoria truncata* (*Brazoria truncata* var. *pulcherrima*, Sand Brazoria or Centerville brazos-mint, and *Polypteris Hookeriana* (*Palafoxia hookeriana* var. *hookeriana*, sand palafoxia). *Juglans rupestris* (*Juglans microcarpa* var. *microcarpa*, little walnut) began to appear along the rocky banks of streams.



Claret cup cactus  
(*Echinocereus coccineus*)

At Mason, a little German town, we resumed our westward march. The soil is generally poor, sandy or gravelly up the Llano Valley with the plain being covered with mesquite brush. At a distance and on both sides of the valley, a continuous line of bold bluffs overlooks the plain. Excepting near the river and an occasional grove of post oaks, the ligneous vegetation is scant and dwarf. The last sign of granitic formation was left in Mason County, and in reaching Kimball all the rocks are limestone. Here for the first time we met the *Sophora speciosa* (*Sophora secundiflora*, Texas mountain laurel or mescal bean), already in fruit, the red beans of which are considered very poisonous. In the fact these beans, scattered over the rocks, seem to be respected by very kind of animal.



Lindheimer's morning glory  
(*Ipomoea lindheimeri*)

Near our camp on the Little Saline Creek, we made a good collection in the valley, including *Tetrorodes Coulteri* [perhaps the spelling in the original field notes were wrong with no genus of *Tetrorodes* currently found, however, *Tetraclea coulteri* Coulter's wrinklefruit could be what was intended], *Berlandiera lyrata* (lyreleaf greeneyes), *Parthenium lyratum* (*Parthenium confertum* var. *lyratum*, Gray's feverfew), *Guara macrocarpa*, (Trans-Pecos beeblossom), *Aristolochia brevipes* (*Aristolochia coryi*, Cory's dutchman's pipe), *Coldenia canescens* (*Tiquilia canescens* var. *canescens* woody crinklemat or rat-ear coldenia), and *Croton Neo-Mexicanum* (*Croton dioicus*, grassland croton). On the neighboring bluffs, *Schoenocaulon Drummondii* (green feathershank), *Lepidium lasiocarpum*, (shaggyfruit Pepperweed), *Abutilon parvulum* (dwarf Indian mallow), *Styrax platanifolia* (*Styrax platanifolius*, sycamore leaf snowbell), *Perezia runcinata* (*Acourtia runcinata*, featherleaf desertpeony), *Chrysactinia Mexicana* (damianita), *Hymenatherum tenuilobum* [NRCS' PLANTS database shows this could be either *Dysodiopsis tagetoides*, false dogfennel or *Thymophylla pentachaeta* var. *pentachaeta*, fiveneedle pricklyleaf], *Atriplex canescens* (fourwing saltbush), and *Leucaena setosa* (should be *Leucaena retosa*, littleleaf leadtree), the last being a remarkably fine shrub. There also occurred two *Yuccas*, *Y. canaliculata* (*Y. treculeana*, Spanish dagger), growing to the height of 9 to 10 feet, and giving to landscape a tropical appearance. The other referred to *Y. rupicola*, (Texas yucca) though I think it is different.

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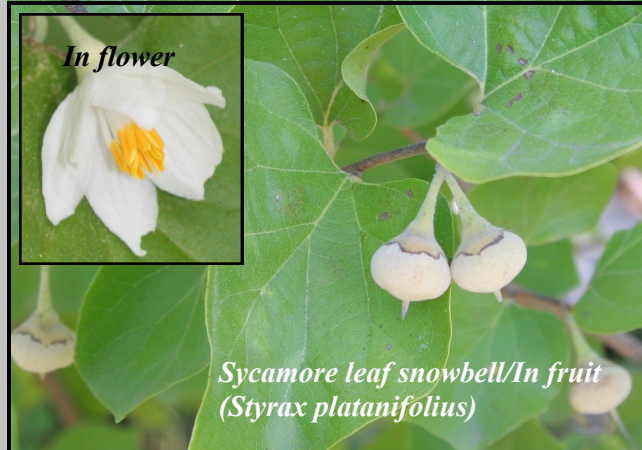
Along the Big Saline Creek, we noticed for the first time since we left Dallas the *Quercus Muehlenbergii* (chinkapin oak), but afterwards we find this species quite abundant in the mountainous region of Southwest Texas.

On May 16, we reached Junction City, where the two forks of the Llano River unite. We pitched our tent in a beautiful spot on the north fork, and if we were not botanizing I would have much to say about the delicious fish, squirrels, beavers, and more. The river is full of *Nuphar advena* (*Nuphar lutea* ssp. *advena*, yellow pond-lily), and near a picturesque fall I collected *Lythrum ovalifolium* (low loosestrife) and *Agrostis verticillata* (*Polypogon viridis*, beardless rabbitsfoot grass). In the thicket covered valley, I noticed the following species, including *Callirhoe pedata* (palmleaf poppymallow), *Antirrhinum maurandioides* (*Maurandella antirrhiniflora*, roving sailor), *Vesicaria Gordoni* [species name not found but genus now a species of *Lesquerella*, one of the bladderpod], *Stillingia Torreyana* (*Stillingia treculiana* Trecul's toothleaf); on the rocky bluffs, *Specularia Lindheimeri* (*Triodanis coloradoensis*, Colorado Venus' looking-glass), *Allionia incarnata* (trailing windmills), *Nicotiana trigonophylla* (*Nicotiana obtusifolia* var. *obtusifolia*, desert tobacco), *Notholaena sinuate* (*Astrolepis sinuata* ssp. *sinuata* wavy scaly cloakfern), and a beautiful *Cereus* unknown to me.

At the foot of a perpendicular rock near the river, I found *Euphorbia chamesula* [species name not found but is one in the spurge family], and a grass new to science called *Festuca Texana* (Texas fescue).

The north fork of the Llano is fringed with a growth of fine timber, but the high bluffs which come closer to the river as we ascend the valley are coerced with bushes or stunted trees with *Quercus Durandii* (*Quercus sinuata* var. *breviloba*, shin oak) making most of the thickets. Very often these bluffs are covered with high walls of hard limestone of dazzling whiteness.

On May 21, we arrived at old Fort Terret, which is situated at the headwaters of the North Llano. All the neighboring hills are densely covered with mountain cedars, such as *Juniperus occidentalis*, var. *conjugens* (*Juniperus ashei*, Ashe juniper). A few plants were collected along the roads, including *Rivina laevis* (*Rivina humilis*, Pigeonberry or Rougeplant), *Penstemon Jamesii* (James' beardtongue), and *Nama Jamaicense* (Jamaicanweed), but nothing different from what we found below.



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West of Fort Terrett we found ourselves on a vast table land, the divide between Devil's River to the west and the Nueces to the south. This country is a perfect desert, with only temporary supplies of watering holes, plenty of grasses though not properly a prairie, being covered with mesquite bush, clumps of post oak and thickets of cedar and live oaks, and the home of the peccary or Mexican hog. The cretaceous rocks crop out in every direction and traveling in a wagon through such country is nothing but punishment. Here the curly Mesquite grass (*Hilaria cenchroides*, *Hilaria belangeri*) abounds, and low and rich spots were perfect masses of the orange-colored flowers of *Coreopsis cardaminaefolia* (*Coreopsis tinctoria* var. *tinctoria* golden tickseed or plains coreopsis). We also observed for the first time *Hoffmanseggia brachycarpa* (*Pomaria brachy-*

*carpa*, broadpod rushpea), *Thelypodium linarifolium* (*Schoenocrambe linearifolia*, slimleaf plainsmustard), *Actinella odorata* (*Hymenoxys odorata*, western bitterweed), one of the commonest plants on the plains of West Texas, and *Erodium cicutarium* (California filaree or cranesbill), but this last I am satisfied was introduced through the agency of transient sheep.

We were detained a whole week at Mackenzie Well, on the head of South Llano. The country is the same as the divide, but I have more leisure for collecting. The following are some of the most interesting plants: on the rocky knolls, *Erythraea calycosa* (*Centaureum calycosum*, Arizona centaury), *Abutilon holosericeum* [possibly *Allowissadula holosericea*, Chisos Mountain false Indianmallow, this plant was once in the *Abutilon* genus], *Encelia calva* (*Simsia calva*, bush sunflower), *Zexmenia hispida* (orange zexmenia). Along with two ferns, *Pellaea flexuosa* (*Pellaea ovata*, ovateleaf cliff-brake) and *Nothoarna sinuate* (*Astrolepis sinuata* ssp. *sinuata*, wavy scaly cloakfern), and in lower places, *Chamaesaracha coronopus* (greenleaf five eyes), *Aristolochia brevipes* (*Aristolochia coryi* Cory's dutchman's pipe), *Dalea rubescens* (*Dalea nana* var. *carnescens*, dwarf prairie clover), *Abutilon Wrightii* (Wright's Indian mallow) and *parvula* (possibly *Abutilon parvulum*, dwarf Indian mallow), *Argythamnia neomexicana* (New Mexico silverbush), and a new variety of *Sporobolus asperifolius* called *brevifolius* by Dr. Vasey (*Muhlenbergia arenacea*, ear muhly).

Also, on the banks of Mackenzie Lake was found *Zappania cuneifolia*, var. *angustissima* (synonym for *Phyla cuneifolia*, wedgeleaf frog-fruit). We collected there many other plants that occur in other western localities, such as *Siphonoglossa pilosella* (*Justicia pilosella*, Gregg's tube tongue often called hairy tube tongue), *Aristida Reverchoni* (*Aristida purpurea*, purple threeawn), *Passiflora tenuiloba* (spread-lobe passion flower), and *Boerhavia viscosa* (synonym for *Boerhavia coccinea*, scarlet spiderling).

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At Mackenzie Well, we were convinced of the futility of trying to reach the San Pedro, or Devil's River, or even the Nueces by the divide, for the trails were nothing but piles of rocks, over which our wagon would not have lived three days. Reluctantly, we took a trail going back to Junction City by the South Llano. We found along this river about the same vegetation as before, but two remarkable plants of this region deserve mention. One is *Nolina Texana* (Sacahuista), whose long leaves are used thatching Mexican huts, and the other *Sotol* (*dasyliirion Texanum*) that I will speak more hereafter.

At Junction City we took the Bandera road, going up Johnson's Creek, where I had the pleasure of collecting for the first time the beautiful *Macrosiphonia Berlandieri* (*Macrosiphonia lanuginosa* var. *macrosiphon*, plateau rocktrumpet), and *Galphimia angustifolia* (narrowleaf goldshower). A gross *Hilaria mutica* (*Pleuraphis mutica*, tobosagrass), quite abundant on the plains of West Texas was found there, and the only locality where I observed it in all our trip. I must not fail to mention the Aljorita bush (*Mahonia trifoliolata*, algerita) are very abundant in these regions, and whose berries either raw or cooked are really good. The Mexicans and settlers use them extensively.

From the headwaters of Johnson's Creek to the head of Guadalupe River, there is a mesa or table land of about 20 miles. The vegetation is similar to that of the divide, and on which the only new plant found was the magnificent *Ipomoea leptophylla* (bush morning-glory). I noticed in a common Texan plant (*Oenothera serrulata*, var. *spinulosa*), whose flowers in the north and west are uniformly yellow that here the stigmas were just black, while a little further south the throat of the corolla also shared in this striking color [matches with *Calylophus berlandieri* ssp. *pinnifolius*, Berlandier's sundrops].

On June 3, we reached the Guadalupe, and the vegetation began to change. In the valley, *Tetragonotheca Texana* (squarebud daisy), *Berlandiera Texana* (*Berlandiera betonicifolia*, Texas greeneyes), *Penstemon Wrightii* (Wright's beardtongue) mostly in seed; on the rocky bluffs, *Eupatorium ageratifolium* (*Ageratina havanensis*, Havana snakeroot) and *Ptelea angustifolia* (*Ptelea trifoliata* ssp. *angustifolia* var. *angustifolia*, common hoptree) that was in fruit; on the banks of the river, *Aspidium patens* [not found in current literature but a species of fern], and in rocky shades, *Asplenium parvulum* (*Asplenium resiliens*, blackstem spleenwort).

The next day there appeared along the river the beautiful Sabine (*Taxodium distichum*, bald cypress). Afterwards, we observed this tree along most of the rivers in the mountainous region northwest of San Antonio. Between Kerrville and Bandera the county is mountainous, covered with good grasses but not very interesting to the botanist, for the only plants collected were *Euphorbia angusta* (*Chamaesyce angusta*, blackfoot sandmat) and *Psoralea cyphocalyx* (*Pediomelum cyphocalyx*, turniproot). It is well to notice that the *Psoralea* bearing that name in Curtis's distribution is a new species called *P. Reverchonii* Watson (*Pediomelum reverchonii*, rock Indian breadroot).

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On June 6, we camped at Bandera's Pass, a very interesting place to the botanist. On both sides of the road are two high and very steep hills, so up those rocky sides I undertook to climb. My time and labor not lost, for I found first at the foot, a very coarse grass, *Epicampes distichophylla* [tortured naming history but seems to be *Muhlenbergia emersleyi*, bullgrass]; next in the rocks, *Nolina Lindheimeriana* (devil's shoestring), higher up, *Prunus copallina* (*Prunus serotina*, escarpment black cherry), *Fendlera rupicola* (cliff fendlerbush), *Rhus cotinoides* (*Cotinus obovatus*, American smoketree) which all are in fruit; in the cedar breaks at the top, *Onosmodium Bejariense* (soft-hair marbleseed) in seed, *Streptanthus bracteatus* (bracted jewelflower), *Verbesina Wrightii* (specie name unknown but likely one of the crownbeards); and on exposed flat rocks, the graceful *Erythra calycosa*, var. *nana* (now *Centaurium calycosu*, Arizona centaury).



White-top sedge  
(*Rhynchospora colorata*)

In nearing Bandera the live oaks grow to an enormous size, and were covered with *Tillandsia recurvata* (small ballmoss). We crossed the Medina at Bandera, where our only discovery was *Amorpha laevigata* (probably *Amorpha roemeriana*, Roemer's false indigo), and took a westerly direction over what was called by inhabitants a good mountain road. Afterwards we understood the meaning of mountain road. Soon we were in very rough country, which we have good reason to believe no botanist ever visited. In fact, no one will ever visit it having any care for his limbs or neck. Of course in such a county progress was slow, and June 1 finds us camped on the banks of a fine stream, whose clear waters were dashing madly among the rocks.

All around were hills clad with shrubbery and covered with overhanging rocks. We were in the wilderness and enjoying it. It would be more than ungrateful not to pay a tribute to the great pile of dainty perch and fine trout lying before our camp fire. Beginning along the rivers, in swampy places are several northern plants, such as *Schoenus nigricans* (black bogrush), *Eleocharis rostellata* (beaked Spikerush), and *Selaginella apus* (*Selaginella apoda*, meadow spikemoss) mixed with *Dichronema leucocephala* (*Rhynchospora colorata*, white-top sedge), and *Reverchonii* (*Rhynchospora nivea*, showy whitetop). Also, *Buchnera elongata* (elongated bluehearts), a variety of *Samolus ebracteatus* (limerock brookweed).

*Epipactis gigantea* (stream orchid) was among the rocks, and at the foot hills *Asclepias perennis* [aquatic milkweed, though this species shows to occur predominately in Southeast Texas], *Aspicarpa hyssopifolia* (hyssopleaf asphed), *Keerlia effusa* (*Chaetopappa effusa*, spreading least-daisy), *Cassia Lindheimeriana* (*Senna lindheimeriana*, Lindheimer senna); on the top rocks, abundance of *Laphamia Lindheimeri* (*Perityle lindheimeri* var. *lindheimeri*, Lindheimer's rockdaisy).

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Good interesting shrubs are also found here, including *Salvia ballotaeflora* (*Salvia ballotiflora*, shrubby blue sage), *Buddleia racemosa* (genus corrected to *Buddleja racemosa*, wand butterflybush), *Philadelphus serpyllifolia* (*Philadelphus serpyllifolius*, thymeleaf mock orange), *Garrya Lindeimeri* (*Garrya ovata* ssp. *lindeimeri*, Lindheimer's silktassel), *Arbutus xalapense*, var. *Texense* (Texas madrone) with the last three all in fruit. The named species is called Madorona by the Indians, a small tree, very peculiar and picturesque in appearance.



Showy menodora  
(*Menodora longiflora*)

As for the ferns, near the water were *Adiantum capillus-veneris* (maidenhair), and *Aspidium patens* (earlier reported as an unknown fern); amidst the rocky shades, *Pellaea flexuosa* (*Pellaea ovata*, ovateleaf cliffbrake), *Cheilanthes Alabamensis* (Alabama lipfern), and *Asplenium parvulum* (*Asplenium resiliens*, blackstem spleenwort). But what made me forget all my falls and bruises was the discovery of the rare *Anemia mexicana* (Mexican fern), growing everywhere in the shade, and the rarest *Pellaea aspera* (*Cheilanthes horridula*, rough lipfern) found on exposed rocks.

At last we were out, emerging from the Sabinal Canyon, and camped on the beautiful stream. Our principal finds are *Capsicum baccatum* (*Capsicum annuum* var. *glabriusculum*, chillipiquin), *Salvia Roemeriana* (cedar sage), *Acalypha hederacea* (*Acalypha monostachya*, round copperleaf), *Russelia tuberosa*, var. *occidentalis* (unable to determine this plant), *Bernardia myricifolia* (mouse's eye), *Cordia podocephala* (Texas manjack), *Polygala ovatifolia*, (eggleaf milkwort), *Indigofera lindheimeriana* (Lindheimer's indigo), *Euphorbia villifera* (*Chamaesyce villifera*, hairy sandmat) and *acuta* (now *C. acuta*, pointed sandmat). Also, *Melochia perramidata* (pyramidflower), *Triodia eragrostoides* (lovegrass tridens), *Muhlenbergia calamagrostoides* (possibly renamed *Muhlenbergia tenuifolia*, slender muhly), *Setaria setosa* [species currently not reported in Texas but one of the bristlegrasses], *Chaptalia nutans* (*Chaptalia texana*, silverpuff), and new *Petalostemon* (*P. luteolus* Wats.) (*Dalea sabinalis*, sabinal prairie clover), as well as a fern, *Notholaena candida* (*Notholaena copelandii*, Copeland's cloak fern), the only one found on the rocky banks of the Sabinal.

One plant deserves special mention, the beautiful *Amoreuxia Wrightii* (Wright's yellowshow), and the peccaries are very fond of its roots. On the sandy plains below the canyon, we find *Dalea pognathera* (bearded prairie clover), *Cevallia sinuata* (stinging cevallia), *Menodora longiflora* (showy menodora), *Leucophyllum Texanum* (*L. frutescens*, *ceniza*), *Mimosa Berlandieri* [possibly referring to *M. pigra* var. *Berlandieri*, Zarza or Coatante which occurs in extreme South Texas], and *Lindheimeri* (*Mimosa texana*, Texas mimosa); and in the richest part of the prairie, *Eupatorium Greggii* (*Conoclinium greggii*, palmleaf thoroughwort) and *Desmanthus reticulatus* (netleaf bundleflower).

(Continued on page 12)



(Continued from page 11—Conservation Time Passages)

Near the Sabinal Canyon is the small canyon of Blanco, in which a curious cave had recently been discovered. Of course this new wonder had to be visited, and on our way we admired the gigantic sotol (*Dasyilirion Texanum*) in all its glory. It is used in Mexico as the Agave, to make an intoxicating liquor, and the bases of the leaves that look like monstrous artichokes, are considered delicious vegetables but we did not touch them. Here we added to our collection such plants as *Heteropogon contortus* (tanglehead), *Fallugia paradoxa* (Apache plume), *Jatropha spatulata* (*J. dioica*, leatherstem), and *Mirabilis Jalapa* (common four o'clock).



Thus far we had a tolerably pleasant time, in spite of set in, the heat was increasingly alarming, the water was sinking very fast into the sandy beds of the rivers, and the vegetation was beginning to shrivel up and disappear. Our team was jaded, our provisions consumed, our clothes in tatters, and our finances exhausted. We had either to refit our expedition or retreat, hence after consultation the march on Mexico was postponed and a retreat ordered. Uvalde was the most southwestern point visited by our expedition, where we found *Malvastrum tricuspidatum* (*Malvastrum bicuspidatum*, shrubby false mallow). Along the Frio, nearly dry all the way were found *Aristolochia longifolia* (*Aristolochia erecta*, swanflower), *Oxalis dichondraefolia* (*O. dichondrifolia*, peonyleaf woodsorrel), and two fine shrubs, *Anisacanthus Wrightii* (*Anisacanthus quadrifidus* var. *wrightii*, flame acanthus) and *Chilopsis saligna* (now *C. linearis*, desert willow).

The homeward journey began on June 20. Between Uvalde and Castroville is an extensive plain, covered with thickets of mesquite, *Acacia Roemeriana* (Roemer acacia), *A. Wrightii* (*Acacia greggii* var. *wrightii*, catclaw acacia), but the most common is certainly *A. Berlandieri* (guajillo). There was also *Condalia Obvasta* (*Condalia hookeri*, brazil), *Celtis nitida* (species name unknown but presumed to be *C. pallida*, granjeno), *Schaefferia cuneifolia* (desert yaupon), and *Diospyros Texana* (Texas persimmon). Among the herbaceous plants were *Dianthera parvifolia* (*Carlowrightia Torreyana*, Torrey's carlow-rightia), *Perezia Wrightii* (*Acourtia wrightii*, desert holly), *Sanvitalia ocymoides* (yellow creeping zinnia), *Helianthus ciliaris* (Texas blueweed), and *Jatropha Berlandieri* (*J. cathartica*, Berlandier's net-tlespurge or jicamilla).

On the banks of the Seco, we gathered *Marsilea macropoda* (bigfoot waterclover), *Neptunia pubescens* (tropical neptunia), and *Synedrella vialis* (*Calypocarpus vialis*, straggler daisy). We noticed also climbing on the mesquite, the singular *Ephedra pedunculata* [this is the true vine ephedra that climbs up into trees as opposed to the more commonly occurring *E. Antisyphilitica* known as ephedra, Mormon's tea or clapweed], but with neither flower nor fruit.

For the most part, the vegetation along the return route was similar to that we had met earlier in coming out, and towards the last of July we reached home.

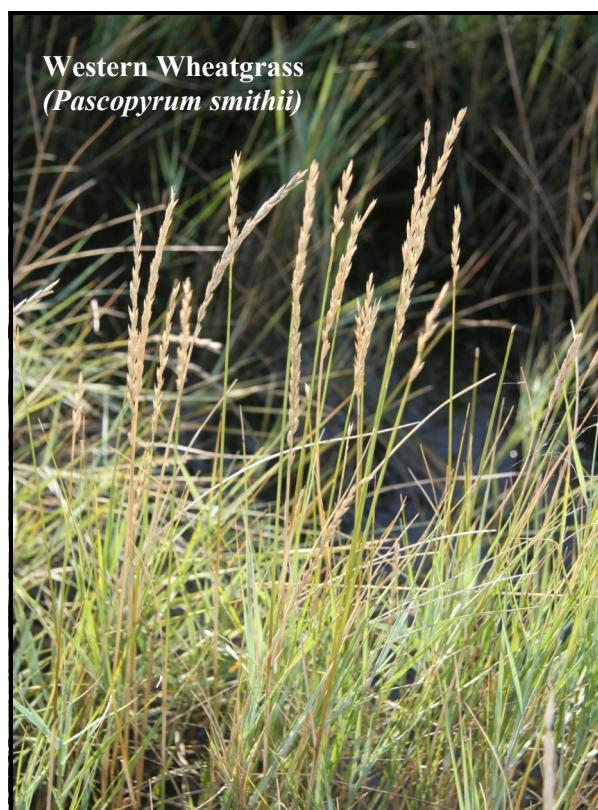
## Common Plants Collected by Dr. Shumard in 1852

Story by Gregory Huber, USDA-NRCS  
Odessa, Texas

In the tradition of Lewis and Clark, most exploring expeditions in the formative years of the United States were accompanied by naturalists. They collected plants, animals, fossils, minerals, and anything else that might have been of value to science or the economic success of the country. The collections of these naturalists, many of whom were medical doctors, and the notes they took along the way could be of great value to us today.

Dr. George Shumard served as surgeon and naturalist on Captain Randolph Marcy's 1852 exploration of the Red River watershed. At the time, no one realized that the headwaters of the Red River were in Texas on the Llano Estacado. The best maps showed the headwaters in the Rocky Mountains. Dr. Shumard was a brother of Benjamin Franklin Shumard, the first state geologist of Texas, and who by the way, Shumard's Oak (*Quercus shumardii*) is most likely named after.

Dr. Shumard must have been at Fort Belknap, Texas, when Marcy arrived to meet his command, the soldiers of Company D, U.S. Army 5<sup>th</sup> Infantry. Leaving on May 2, they marched north through the upper Trinity River, the Little Wichita River, and the Wichita River watersheds to the confluence of Cache Creek with the Red River.



Western Wheatgrass  
(*Pascopyrum smithii*)

Along the way to the headwaters and in returning, Dr. Shumard collected plants, fossils, rocks and minerals. His collection of plants and his field notes would go to Dr. John Torrey in New York. When the report of the expedition was published in 1854, Dr. Torrey was the author of the botany report. Dr. Torrey used Shumard's notes on location and abundance in his report. He described 16 species as being common or abundant.

For instance, upright prairie coneflower (*Ratibida columnifera*, which was in the genus *Lepachys* of Rafinesque at the time), and sand sagebrush (*Artemisia filifolia*) were reported as common throughout the watershed. Two other plants, wild onion (*Allium reticulatum*, which is probably *canadense* from plants.usda.gov), and quackgrass (*Triticum repens*, now in the genus *Elymus* and most likely a misidentification) are described as common on the tributaries of the Red River without the "upper" modification.

In 1852, this Western Wheatgrass, above, is what Dr. Shumard would have found on the Red River.

(Continued on page 16)

## Riparian Workshop Helps Landowners in Salado

*Story by Randy Henry, USDA-NRCS  
Weatherford, Texas*

The USDA Natural Resources Conservation Service (NRCS) presented an informative riparian workshop recently at the Salado Municipal Building in Salado, Texas.

The workshop helped Salado landowners and residents in Bell County gain knowledge about riparian functions, hydrology/ fluvial geomorphology principles and interactions, and riparian vegetation that can enhance property that has been impacted by flooding in the Salado area over many years. Historically, Salado Creek has produced several damaging floods from torrential rainstorms, resulting in floodwaters coursing over dam spillways.

“Landowners are the water managers of Texas and very important to the land around Salado Creek,” said Ricky Linex, NRCS wildlife biologist in Weatherford. “Soil, water and vegetation are not only a valuable triangle, but a well-built machine that must function together to be successful for the land near Salado Creek.”

The workshop kicked off with a presentation about riparian functions by Linex, followed by Kenneth Mayben, NRCS civil engineer in Weatherford, discussing hydrology/fluvial geomorphology principles and interactions. He delivered a detailed presentation about how streams can meander, as well as how the process is different within each stream, due to variations in elevation, vegetation, soils, and contribution or impediments from man and animals.

A tour of the Robertson Plantation also was provided so attendees could view the Salado Creek riparian sites within the plantation and near the city of Salado. Attendees were able to gain information about the riparian vegetation surrounding the urban and rural landscapes.

Robertson Plantation is an 851-acre plantation and ranch built in the 1850s, and still is owned by the original family descendants of Col. E. Sterling C. Robertson.

“Salado Creek is changing with the times and we want it to stay natural and in good health for the springs, the local community, and the city of Salado,” said Cile Cowan, an heir to Col. Robertson and plantation co-owner.

The tour ended with Linex showing attendees what plants offer good riparian vegetation on the Robertson Plantation. The plant types and riparian vegetation shown to the group included trees, shrubs, forbs, sedges, and grasses that deter erosion and flood damage to the stream.



*Left to right) Kaleb Pool, NRCS soil conservationist in Bartlett, Ricky Linex, NRCS wildlife biologist in Weatherford, and Kenneth Mayben, NRCS civil engineer in Weatherford, presented onsite demonstrations about riparian vegetation within an urban and rural landscape during a tour of Salado Creek on the Robertson Plantation in Salado, Texas. (Photo Credit: Randy Henry, USDA-NRCS)*



# Illinois Bundleflower (*Desmanthus illinoensis*)

Story by Alan Shadow, Manager

USDA-NRCS East Texas Plant Materials Center

Nacogdoches, Texas

Illinois bundleflower (*Desmanthus illinoensis*) is a native, warm season, perennial, legume found throughout the eastern half of the United States. It grows to approximately 3-feet in height, has bi-pinnate leaves, and produces a white, puff shaped flower. Seed matures in late-summer in small pods that form a whirl or bundle shape, making it easily recognizable.

Illinois bundleflower is extremely adaptable, and will tolerate a wide array of environmental conditions and soil types. It is deep-rooted, drought and winter hardy, and will tolerate burning in its dormant state. It typically favors moist sites with medium textured soils, and is often found in low areas and wet slopes. It is an important component of the tall grass prairie, and its presence indicates good range conditions.

Illinois bundleflower provides essential resources for wildlife. It provides excellent cover, browsed and/or grazed by large game species such as deer and pronghorn. It is also readily eaten by all classes of livestock with forage quality analysis showing protein levels similar to domesticated legumes. The seeds are utilized by several species of birds and small mammals, and it shows potential for use as a grain and oil crop for humans. Its white blooms are attractive to a wide array of pollinating insects, and its hardiness makes it a reliable plant even under adverse conditions.

The Plant Materials Program has developed and released 'Sabine' Illinois bundleflower through the James E. "Bud" Smith Plant Materials Center in Knox City, Texas, and 'Reno' Illinois bundleflower through the Manhattan Plant Materials Center in Manhattan, Kansas. Both releases are recommended for wildlife habitat improvement, range, pasture, and restoration of disturbed sites. Seed should be planted approximately  $\frac{1}{4}$  to  $\frac{3}{4}$  inches deep at a rate of 2 to 2.5 pounds pure live seed (PLS) per acre for a monotypic stand, or approximately one PLS pound per acre in seed mixes. *Desmanthus spec. 1* inoculant should be used to promote nitrogen fixation, and seed scarification will improve germination during the first growing season.

If scarification is not possible, a late fall or early spring planting is recommended to cold stratify the seed to improve germination. Plantings may not reach their full potential until the second or third year. Seed production is prolific and averaged 926 pounds per acre over a nine-year period in Knox City, Texas. (Photos courtesy of USDA-NRCS)



Puff-Shaped Blooms



Seed Bundles



Vegetative State

(Continued from page 13—Common Plants Collected by Dr. Shumard in 1852)

Other plants, including Mexican prickly poppy (*Argemone mexicana*), common hoptree (*Ptelea trifoliata*), nine anther prairie clover (*Dalea laxiflora*, now *enneandra*), longbract wild indigo (*Baptisia leucopheae*, now *bracteata*), yellow sundrops (*Oenothera serrulata*, now *Calylophus serrulatus*), Indianhemp (*Apocynum cannabinum*), firewheel (*Gaillardia pulchella*), and fourwing saltbush (*Obione canescens*, now in the genus *Atriplex*) were common in the upper tributaries of the Red River.

Only four species were reported as abundant. They include touristplant (*Dithyrea wislizeni*, now *Dimorphocarpa wizlizeni*) on the headwaters of the Red River, sand grape (*Vitis rupertris [sic]*, correct spelling is *rupestris*) in the Wichita Mountains, and *Quercus undulata* (see plants.usda.gov), and Virginia spiderwort (*Tradescantia virginica [sic]*, correct spelling is *virginiana*) on the upper tributaries of the Red River.

There are interesting observations that can be drawn from this data. Six of the common or abundant species are shrubs or woody vines. *Dalea sp.* can also be low shrubs so *Dalea enneandra* might be included as well. The rest of the common or abundant species were perennial forbs with the exception of quackgrass. Of the 212 species collected only 29 were grasses, equaling 13 percent of the total. This is in a region that we call the Rolling Red Plains and Grand Prairie. How can this be?

Well, Shumard did not collect everything he saw. There are hundreds of additional species that might have been collected that he did not collect. Part of this is due to the fact that he tried to collect plants with flowers and fruit, though not exclusively. He may have been more interested in wildflowers, or he may have been collecting plants that were not personally familiar. Dr. Shumard had to be selective in his collecting due to time and transportation constraints.

Whatever the case, his collection is valuable from several perspectives. First, it is a pre-settlement collection, and the collection comes with complementary data (meteorological, geology, soils and topographical data). And last, but not least, the collection is apparently the only one made by Dr. George Shumard that was ever published.

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